

2.4 Intersecting Linear Models

A resort area has two main attractions—the Big Fun amusement park and the Get Reel movie multiplex. The number of visitors to each attraction on a given day is related to the probability of rain.

This table gives attendance and rain-forecast data for several Saturdays.

Saturday Resort Attendance

| Probability of Rain (%) | 0 | 20 | 40 | 60 | 80 | 100 |
|-------------------------|-------|-----|-----|-----|-----|-----|
| Big Fun Attendance | 1,000 | 850 | 700 | 550 | 400 | 250 |
| Get Reel Attendance | 300 | 340 | 380 | 420 | 460 | 500 |

The same company owns both businesses. The managers want to be able to predict Saturday attendance at each attraction so they can assign their workers efficiently.

Problem 2.4 Intersecting Linear Models

- A.** Use the table to find a linear equation relating the probability of rain p to
1. Saturday attendance A_B at Big Fun.
 2. Saturday attendance A_G at Get Reel.
- B.** Use your equations from Question A to answer these questions. Show your calculations and explain your reasoning.
1. Suppose there is a 50% probability of rain this Saturday. What is the expected attendance at each attraction?
 2. Suppose 460 people visited Big Fun one Saturday. Estimate the probability of rain on that day.
 3. What probability of rain would give a predicted Saturday attendance of at least 360 people at Get Reel?
 4. Is there a probability of rain for which the predicted attendance is the same at both attractions? Explain.

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